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Fields in West Virginia, Joseph D. Weeks, pp. 573-590.

The first paper has popular interest but no geological importance. The second is an excellent summary of the country's mineral springs and will be often serviceable for reference. A list of the leading ones by States is included. The third paper has valuable data on the amount of flow in Western rivers, and on the Potomac, Connecticut and Savannah in the East. It will aid in the advancement of irrigation in the West, and our general hypsometric knowledge. The fourth paper is a most important contribution to the geology and petrography of the area discussed. It shows the great part played by laccolites in some of the best known Colorado mountains and the close parallelism that exists among them all in the character of the rocks. In the fifth paper Mr. Lindgren ably discusses the interesting gold-quartz veins of the Ophir district, Placer county, and draws some well based conclusions as to their method of origin. In the sixth paper Mr. Keith brings out a vast amount of new and important knowledge about the metamorphic and paleozoic belt that passes from Pennsylvania south through Hagerstown and Harper's Ferry, Md., and across West Virginia and Virginia to the Rappahannock River. Besides describing the local structural geology, and its development the paper includes an important contribution to the dynamic metamorphism of pre-Cambrian igneous rocks, both plutonic and volcanic. In the seventh paper Mr. Diller takes up the Tertiary changes in that most interesting problem, the recent geological history of the Pacific coast. The ancient base levels are traced and many important conclusions are deduced, which have a close connection with the auriferous gravels. Mr. Turner's paper (the eighth) presents an admirable review of the geology of the Sierras and adds greatly to our knowledge of their petrography. In the first part of the ninth paper Mr. Walcott describes the relations of the pre-Cambrian lava sheets to the other Algonkian terranes of the Grand Canyon, and gives detailed sections and views. Prof. Iddings identifies them as surface or submarine flows of basalt. In the tenth and eleventh papers Prof. Dale extends the area covered by his previously pub-

lished work in the metamorphic belt of the New York and New England border and especially in the latter, clears up the geology of a mountain famous alike for its geology and lovely scenery. Both papers are also important contributions to our knowledge of the mineralogical changes involved in the passage of sediments into schists and marbles. In the last paper Mr. Weeks describes, under the name of the Potomac basin, the important coal field that extends from Wellersburg, Pa., across Maryland into West Virginia, and that embraces the Cumberland or George's Creek coal of Maryland, and the Elk Garden and Upper Potomac coals of West Virginia. Analyses, sections and statistics are given.

The Production of Tin in Various Parts of the World. By CHARLES M. ROLKER. Advance excerpt from the Sixteenth Annual Report of the Director of the U. S. Geological Survey. 1894-1895. Part III. Mineral Resources of the United States. Calendar Year. 1894. Pp. 1-88.

It would appear from the above reference that the forthcoming annual reports of the Director of the Survey are to have a regular department devoted to Mineral Resources. This is to be warmly commended, both because it affords material that is of value to the general public, which is after all the Survey's real constituency, and because it caters to the scientific public as well. Many friends of the Survey have viewed with regret in recent years the small prominence that this portion of its work has received, and have felt that it was a mistaken policy.

Mr. Rolker gives an admirable and concise review of tin ores, their geology, statistics and the expense of production the world over. The report covers much the same ground in many respects as that treated by Professor Ed. Reyer in his 'Zinn, eine geologisch-montanistisch-historische Monografie,' that appeared in Berlin in 1881, but Mr. Rolker brings the subject down to date, omits many theoretical discussions and makes especially prominent those points that are of importance in their practical relations. The geology of cassiterite is curiously uniform, wherever the mineral is found. Veins in or

near granite or gravels yielded by them are its sources, whether it be in Cornwall, the Zinnwald, the Malay peninsula or Australia. The large part played by tin in the bronze implements of the ancients and even in prehistoric commerce give it peculiar claims to interest. Enormous attention has been devoted to tin mines in this country of late years, so much that the metal has even been a political factor, loudly heralded in recent campaigns. All our enterprises have as yet been without success, and some are instructive examples of extravagant folly. Mr. Rolker's dispassionate and truthful descriptions are timely and much to be commended.

J. F. KEMP.

The Natural History of Plants, their Forms, Growth, Reproduction and Distribution, from the German of Anton Kerner von Marilaun. By F. W. OLIVER, with the assistance of MARIAN BUSK and MARY F. EWART. With about 1,000 original woodcut illustrations and sixteen plates in colors. New York, Henry Holt & Co. 1895. 2 vols., large 8vo.

This is a most interesting and readable book. It is written in a clear and popular style; few technical terms are used, except where necessary for the sake of accuracy, and the illustrations are fine and full of interest. The whole plan of the work is to treat plants as living things and to find a biological significance for all the parts of which a plant is formed. Here will be found answered many of what may be called the practical questions about plants; such as why certain species grow in peculiar places, how they are adapted to the conditions which surround them, how they get their food, of what this food consists, how it is conducted and formed into organic matter, and the structures and forms resulting. As the author says, "For us no fact is without significance. Our curiosity extends to the shape, size and direction of the roots, to the configuration, venation and insertion of the leaves; to the structure and color of the flowers, and to the form of the fruit and seeds; and we assume that even each thorn, prickle or hair has a definite function to fulfil." The author claims the advantageous aid of imagination in his scientific researches and says

that "the more imagination an investigator has the more keenly is he goaded to discovery by this craving for an explanation of things and for a solution of the mute riddle which is presented to us by the forms of plants." It is probably due to this feature of the work that it is so readable, and yet its scientific facts do not suffer on this account. The first four chapters are devoted to the living principle in plants. Protoplasts are considered as the seat of life; the discovery of the cell and of protoplasm is recounted with illustrations of both; the movements of protoplasts are illustrated from the swarm spores of seaweeds, and the mosses and ferns; the movements of Volvocinæ, Diatomaceæ and Bacteria are described; the continuity of protoplasm through the cell walls and its relation to vital force and sensation are explained.

Under the heading of the Absorption of Nutrient, inorganic and organic foods are treated, the absorption of water and the character of soils, as well as the symbiotic relations of plants.

One of the most interesting chapters discusses the relations of the position of foliage leaves to that of absorbent roots, proving that the leaves conduct the rain to the point on the ground where the roots of the plant can get it; the peripheral increase of the leaves keeping pace with that of the roots. Most interesting diagrams are given of the position of leaves to facilitate this irrigation. In treating of Saprophytes illustrations are drawn of those in water, on the bark of trees and on rocks. Examples are cited from the simplest as well as the most highly organized plants, and many suggestions are given as to the habitats of plants.

The Absorption of Nutrient by parasitic plants is described at length and illustrated by numerous strange and unfamiliar examples. Carnivorous plants also receive ample attention and are illustrated by numerous cuts and a colored plate.

Under the heading of the Conduction of Foods, the author treats of the regulation of transpiration and the means by which leaves are protected from excessive dryness in exposed localities. The diversity in the structure of leaves is almost marvelous, and the figures given are of great variety and interest. In this